REMARKS/ARGUMENTS

Claims 2-3, 5-6, 9, 30-31, 34-39, 41-43, 45-47, 49-51, 53-55, 57-59, 61-63, 65-67 and 71-73 stand rejected under 35 U.S.C. 103 as being unpatentable over Hollowell, II et al. in view of Kikinis and further in view of Gephardt et al. By this amendment Claims 2-3, 5-6, 9, 30-31, 34-39, 41-43, 45-47, 49-51, 53-55, 57-59, 61-63, 65-67 and 71-73 have been canceled. Accordingly, the rejection of Claims 2-3, 5-6, 9, 30-31, 34-39, 41-43, 45-47, 49-51, 53-55, 57-59, 61-63, 65-67 and 71-73 stand rejected under 35 U.S.C. 103 as being unpatentable over Hollowell, II et al. in view of Kikinis and further in view of Gephardt et al. is now moot.

Claims 17-21 and 23 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Hollowell, II et al in view of Kikinis and further in view of Chen et al. By this amendment Claims 17-21 and 23 have been amended to be allowable over the cited references. More specifically:

Claim 17, as amended, requires and positively recites, an apparatus, comprising: "means for **sampling a temperature** associated with the operation of a processing unit within said apparatus", "means, **responsive to said sampled temperature, for predicting future temperature associated with the operation of said processing unit**" and "means for using said prediction for automatic control of temperature within said apparatus".

Claim 18, as amended, requires and positively recites, an apparatus, comprising: "means for **sampling a temperature** associated with the operation of said apparatus", "means, responsive **to said sampled temperature, for predicting future temperature associated with the operation of said apparatus**" and "means for using said prediction for automatic temperature control within said apparatus".

Claim 21, as amended, requires and positively recites, an apparatus, comprising: "means for **sampling a temperature** within said apparatus and, **using said sampled temperature at least once as a starting point, predicting future changes in said**

temperature" and "means, responsive to said means for sampling and predicting, for automatically adjusting the processing speed of a processing unit by modifying a clock signal utilized by the processing unit, to maintain said temperature within said apparatus below a selected reference temperature.

In contrast, none of the references, individually, or in combination, teach or suggest an apparatus having BOTH actual temperature sampling AND temperature prediction in the same device. Indeed, the Board of Appeals in its Decision on Appeal specifically set forth the following motivation for combining the references:

> In our view, the question here is whether it would have been obvious to the artisan **to replace** the actual temperature measurements of Hollowell or Kikinis with predicted temperature measurements as taught by Chen (Decision on Appeal, page10, lines17-20).

As determined by the Board, the resulting combination of Hollowell, Kikinis and Chen would result in an apparatus having no actual temperature measurement, relying instead solely on temperature prediction. In contrast, Claims 17, 18 and 21, as amended, require actual temperature measurement (i.e., means for sampling a temperature) and means for predicting temperature. Accordingly, there is no motivation whatsoever in the prior art that suggests combining BOTH temperature measurement and temperature prediction for prediction of future temperatures.

Just in case the Examiner disagrees that temperature sampling is the same as temperature measurement, Webster's II New Riverside University Dictionary (1984) defines the term "sample" as:

> 1. a. A part representative of a whole. B. An entity representative of a class: SPECIMEN. 2. Statistics. A set of elements drawn from and analyzed to estimate the characteristics of a population (ADDENDUM-3).

Moreover, Applicant's use of the term "sampling" in the specification clearly implies an actual temperature measurement (specification, page 17, lines 3-12) – NOT an estimate of temperature. Accordingly, the combination of Hollowell, Kikinis and Chen, as defined by the Board, does not teach or suggest, "means for **sampling a temperature** associated with the operation of a processing unit within said apparatus", "means, **responsive to said sampled temperature, for predicting future temperature associated with the operation of said processing unit**", as required by Claim 17, or "means for **sampling a temperature** associated with the operation of said apparatus", "means, responsive **to said sampled temperature, for predicting future temperature associated with the operation of said apparatus**", as required by Claim 18, or "means for **sampling a temperature** within said apparatus and, **using said sampled temperature at least once as a starting point, predicting future changes in said temperature**", as required by Claim 21. Each of these claims requires both a means for sampling (i.e., measuring) temperature and a means, responsive to the temperature sampling (Claims 17 and 18) or which uses the sampled temperature as a starting point, for predicting future temperature or changes in temperature (such combination supported in the specification, page 22, lines 5-6).

Applicant further points out that that Chen does not "indirectly measure" anything. Chen does not disclose any circuitry for indirect "measurement" of the processor or apparatus at issue. Chen discloses estimation of temperature based upon models of actual temperature change measurements of a previous microprocessor operating at low and high speeds which was previously recorded in a digital format in storage registers (CHEN, ABSTRACT, lines 1-6).

In light of the above one having ordinary skill in the art would not have been motivated to combine the Hollowell, Kikinis and Chen references in any manner that would have obviated the invention of Claims 17, 18 and 21, as amended. Accordingly, the present rejection of Claims 17, 18, 21 (and their dependent claims) as being obvious under 35 U.S.C. 103(a) over Hollowell in view of Kikinis and Chen is erroneous and should be withdrawn.

Claims 19, 20 and 23 stand allowable as depending from allowable claims and including further limitations not taught or suggested by the references of record.

Claim 19, as amended, further defines the apparatus of Claim 17, by including means for user modification of said temperature predictions. Claim 19 stands allowable for the reasons set forth in support of the allowance of Claim 17. Moreover, none of the references teach or suggest means for user modification of said temperature predictions. Accordingly, Claim 19 stands allowable.

Claim 20, as amended, further defines the apparatus of Claim 18, including means for user modification of said temperature predictions. Claim 20 stands allowable for the reasons set forth in support of the allowance of Claim 17. Moreover, none of the references teach or suggest means for user modification of said temperature predictions. Accordingly, Claim 20 stands allowable.

Claim 23, as amended, further defines the apparatus of Claim 21, wherein said adjustments are accomplished within the processing unit cycles and do not affect the user's perception of performance. Claim 23 stands allowable for the reasons set forth in support of the allowance of Claim 21. Moreover, none of the references teach or suggest wherein said adjustments are accomplished within the processing unit cycles and do not affect the user's perception of performance. Accordingly, Claim 23 stands allowable.

New Claims 74, 75 and 76 similarly stand allowable.

New Claim 74 requires and positively recites, an apparatus, comprising: "a temperature controller **for monitoring temperature within said apparatus and, using said monitored temperature at least once as a starting point, predicting future changes in said monitored temperature**" and "a clock manager adapted to receive a control signal from said temperature controller, said clock manager selectively stopping clock signals from being sent to a processing unit when one of: a) said monitored temperature rises to at least a selected reference temperature,

and b) said predicted changes in said monitored temperature are rising at a faster than acceptable rate".

New Claim 75 requires and positively recites, an apparatus, comprising: "a temperature controller **for monitoring temperature within said apparatus and, using said monitored temperature at least once as a starting point, predicting future changes in said monitored temperature**" and "a clock manager adapted to receive a control signal from said temperature controller, said clock manager designating that a processing unit receives a first clock signal unless one of: a) said monitored temperature rises to at least a selected reference temperature level, **and b) said predicted changes in said monitored temperature are rising at a faster than acceptable rate**, pursuant to which said clock manager designating that said processing unit receives a second clock signal".

New Claim 76 requires and positively recites, an apparatus, comprising: "a temperature controller **for monitoring temperature within said apparatus and, using said monitored temperature at least once as a starting point, predicting future changes in said monitored temperature**" and "a clock manager adapted to receive a control signal from said temperature controller, said clock manager reducing processing unit clock speed when one of: a) said monitored temperature rises to at least a selected reference temperature level, **and b) said predicted changes in said monitored temperature are rising at a faster than acceptable rate**".

New Claim 122 requires and positively recites, an apparatus, comprising: "a temperature controller **for monitoring temperature within said apparatus and, using said monitored temperature at least once as a starting point, predicting future changes in said monitored temperature**" and "a clock manager adapted to receive a control signal from said temperature controller, said clock manager **selectively raising the frequency of clock signals being sent to a processing unit** when one of: a) said monitored temperature **drops to at least a selected reference temperature**, and b) said predicted changes in said monitored temperature **are at an acceptable rate**".

In contrast, the cite references fail, alone or in combination, to teach or suggest the above high-lighted combinations. As a result, new independent Claims 74, 75, 76 and 122 stand allowable.

Claims 77-121 stand allowable as depending from allowable claims and including further limitations not taught or suggested by the references of record.

New Claim 77 further defines the apparatus of Claim 74, wherein said processing unit is a central processing unit (CPU).

New Claim 78 further defines the apparatus of Claim 75, wherein said processing unit is a central processing unit (CPU).

New Claim 79 further defines the apparatus of Claim 76, wherein said processing unit is a central processing unit (CPU).

New Claim 80 further defines the apparatus of Claim 74, further comprising: a provision for user input coupled to said processing unit, and a provision for user output coupled to said processing unit.

New Claim 81 further defines the apparatus of Claim 75, further comprising: a provision for user input coupled to said processing unit, and a provision for user output coupled to said processing unit.

New Claim 82 further defines the apparatus of Claim 76, further comprising: a provision for user input coupled to said processing unit, and a provision for user output coupled to said processing unit.

New Claim 83 further defines the apparatus of Claim 74, wherein said clock manager further stops clock signals from being sent to a bus coupled to the processing unit.

New Claim 84 further defines the apparatus of Claim 75, wherein said clock manager further stops clock signals from being sent to a bus coupled to the processing unit.

New Claim 85 further defines the apparatus of Claim 76, wherein said clock manager further stops clock signals from being sent to a bus coupled to the processing unit.

New Claim 86 further defines the apparatus of Claim 83, wherein said clock manager further stops clock signals from being sent to any other processors connected to the bus.

New Claim 87 further defines the apparatus of Claim 84, wherein said clock manager further stops clock signals from being sent to any other processors connected to the bus.

New Claim 88 further defines the apparatus of Claim 85, wherein said clock manager further stops clock signals from being sent to any other processors connected to the bus.

New Claim 89 further defines the apparatus of Claim 74, wherein said temperature controller is on board said processing unit.

New Claim 90 further defines the apparatus of Claim 75, wherein said temperature controller is on board said processing unit.

New Claim 91 further defines the apparatus of Claim 76, wherein said temperature controller is on board said processing unit.

New Claim 92 further defines the apparatus of Claim 74, wherein said monitored temperature is detected via a temperature sensor coupled to said processing unit.

New Claim 93 further defines the apparatus of Claim 75, wherein said monitored temperature is detected via a temperature sensor coupled to said processing unit.

New Claim 94 further defines the apparatus of Claim 76, wherein said monitored temperature is detected via a temperature sensor coupled to said processing unit.

New Claim 95 further defines the apparatus of Claim 74, wherein said temperature sensor is mounted within said processing unit.

New Claim 96 further defines the apparatus of Claim 75, wherein said temperature sensor is mounted within said processing unit.

New Claim 97 further defines the apparatus of Claim 76, wherein said temperature sensor is mounted within said processing unit.

New Claim 98 further defines the apparatus of Claim 74, wherein said temperature sensor is mounted on a printed wiring board (PWB) adjacent said processing unit.

New Claim 99 further defines the apparatus of Claim 75, wherein said temperature sensor is mounted on a printed wiring board (PWB) adjacent said processing unit.

New Claim 100 further defines the apparatus of Claim 76, wherein said temperature sensor is mounted on a printed wiring board (PWB) adjacent said processing unit.

New Claim 101 further defines the apparatus of Claim 74, wherein said temperature is sensed on a periodic basis.

New Claim 102 further defines the apparatus of Claim 75, wherein said temperature is sensed on a periodic basis.

New Claim 103 further defines the apparatus of Claim 76, wherein said temperature is sensed on a periodic basis.

New Claim 104 further defines the apparatus of Claim 101, wherein the frequency of said temperature sensing changes as said temperature reaches preselected threshold values.

New Claim 105 further defines the apparatus of Claim 102, wherein the frequency of said temperature sensing changes as said temperature reaches preselected threshold values.

New Claim 106 further defines the apparatus of Claim 103, wherein the frequency of said temperature sensing changes as said temperature reaches preselected threshold values.

New Claim 107 further defines the apparatus of Claim 101, wherein the frequency of said temperature sensing is user modifiable.

New Claim 108 further defines the apparatus of Claim 102, wherein the frequency of said temperature sensing is user modifiable.

New Claim 109 further defines the apparatus of Claim 103, wherein the frequency of said temperature sensing is user modifiable.

New Claim 110 further defines the apparatus of Claim 74, wherein said clock manager avoids selectively stopping clock signals from being sent to said processing unit when said processing unit is processing critical I/O.

New Claim 111 further defines the apparatus of Claim 75, wherein said processing unit receives said first clock signal while processing critical I/O irregardless of said one of: a) said monitored temperature rises to a level at and above a selected reference temperature level, and b) said predicted changes in said monitored temperature are rising at a faster than acceptable rate.

New Claim 112 further defines the apparatus of Claim 76, wherein said clock manager avoids reducing said processing unit clock speed when said processing unit is processing critical I/O.

New Claim 113 further defines the apparatus of Claim 74 wherein said clock manager selectively restores said processing unit clock speed when said monitored temperature drops to at least a selected reference temperature.

New Claim 114 further defines the apparatus of Claim 74, wherein said clock manager selectively restores said reduced processing unit clock speed when a critical operation is detected

New Claim 115 further defines the apparatus of Claim 74, wherein said clock manager selectively restores said reduced processing unit clock speed while a critical operation is processed.

New Claim 116 further defines the apparatus of Claim 75, wherein said clock manager further designates that said processing unit receives said first clock signal when said monitored temperature drops to at least a selected reference temperature.

New Claim 117 further defines the apparatus of Claim 75, wherein said clock manager designates that said processing unit receives said first clock signal in response to detection of a critical operation, regardless if one of: a) said monitored temperature rises to at least a selected reference temperature, and b) said predicted changes in said monitored temperature are rising at a faster than acceptable rate.

New Claim 118 further defines the apparatus of Claim 75, wherein said clock manager designates that said processing unit receives said first clock signal in response to processing of a critical operation, regardless if one of: a) said monitored temperature rises to at least a selected reference temperature, and b) said predicted changes in said monitored temperature are rising at a faster than acceptable rate.

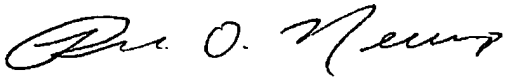
New Claim 119 further defines the apparatus of Claim 76, wherein said clock manager raises said reduced processing unit clock speed when said monitored temperature drops to at least a selected reference temperature.

New Claim 120 further defines the apparatus of Claim 76, wherein said clock manager raises said reduced processing unit clock speed when a critical operation is detected

New Claim 121 further defines the apparatus of Claim 76, wherein said clock manager raises said reduced processing unit clock speed while a critical operation is processed.

Claims 2-3, 5-6, 9, 30-31, 34-39, 41-43, 45-47, 49-51, 53-55, 57-59, 61-63, 65-67 and 71-73 have been canceled. Accordingly, the rejection of Claims 2-3, 5-6, 9, 30-31, 34-39, 41-43, 45-47, 49-51, 53-55, 57-59, 61-63, 65-67 and 71-73 stand rejected under 35 U.S.C. 103 as being unpatentable over Hollowell, II et al. in view of Kikinis and further in view of Gephardt et al. is now moot. Claims 17-21 and 23 have been amended to be allowable over the cited art. New Claims 74-122 have been added and are similarly allowable over the references of record.

Respectfully submitted,



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